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ABSTRACT

The majority of developing countries are experiencing increasing pressure on already taxed education resources. Contributing factors include spiralling population growth, government policies to achieve universal primary education, attempts to reduce high teacher-pupil ratios, and the shortage of professionally trained and/or academically qualified teachers. Strategies that have been adopted to remedy teacher shortages include the use of: (1) double shifts with increasing teacher-pupil ratios; (2) expatriate teachers; (3) increasing female participation; (4) home- or community-based school equivalency programs; (5) in-school equivalency programs; (6) school broadcasts; and (7) inservice teacher education through distance teaching. The University of Nairobi (Kenya) currently provides correspondence courses which include radio broadcasts and face-to-face teaching during occasional residential sessions. The University of the South Pacific has Extension Centers in 10 of the 11 participating countries which are linked to the main campus in Suva (Fiji) through satellite audio-teleconferencing. The University of the West Indies also uses satellite teleconferencing to offer courses for the 14 English-speaking Caribbean islands. Three main campuses are located in Jamaica, Trinidad, and Barbados; and University Centers are maintained in each of the 11 other countries. Carefully designed and implemented distance education programs can provide effective parallel systems to traditional training patterns, and are likely to remain a continuing solution well into the future. (19 references) (BBM)

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In-service teacher education at a distance: trends in Third World development

Third World countries face major shortages of trained and qualified teachers, particularly for primary schools. In this article, Gary Coldevin (a Professor in the Graduate Programme in Educational Technology at Concordia University, Montreal) and Som Naidu (a distance education course developer at the University of the South Pacific, currently taking a PhD at Concordia) outline some strategies which have been employed to remedy such teacher shortages. They place particular emphasis on the provision of in-service education by distance methods, and describe the systems used in Kenya and at the Universities of the South Pacific and the West Indies as illustrations of current models of distance education practice.

Gary Coldevin and Som Naidu

A common characteristic spanning the majority of developing countries – and stemming directly from spiralling population growth – is an increasing pressure on already taxed education resources. The strain is particularly acute at the primary school level. A comparison of demographic trends in developed and developing countries quickly illustrates the extent of this generalised problem. The population of the world at mid-1988 was estimated at 5.1 billion (Haub and Kent, 1988),[1] with inhabitants of the developing nations outnumbering those in the industrialised ones by almost four to one. Further, Third World countries are growing at an overall rate which is three-and-a-half times faster than that pertaining in developed areas; and, most directly relevant to the present discussion, less developed nations have an average of 37 per cent of their citizens under the age of 15, as opposed to 22 per cent for the developed world. Africa as a continent heads the list with 45 per cent, but Latin America at 38 per cent and Asia at 35 per cent are also very high. (All the above figures, plus other relevant information, are included in Table 1.)

A closer look at the population doubling times of selected countries graphically highlights the exponential dimensions of the mushrooming statistics. For example, as Table 2 shows, Kenya ranks foremost among the nations of the world with a very short doubling time of 17 years, but Tanzania, the Solomon Islands, Uganda and Nicaragua are close behind. (In fact Nigeria, at 24 years, is expected to become the third most populous country – after China and India – with well over 600 mil-

Table 1 Global and regional demographic trends (to mid-1988)

Area	Population (millions)	Natural increase	Doubling time (years)	% Under 15	% Urban
World	5,128 (100%)	1.7%	40	33	45
More developed	1,197 (23%)	0.6%	120	22	73
Less developed	3,931 (77%)	2.1%	33	37	37
Less developed (excluding China)	2,844 (55%)	2.4%	29	40	35
Asia	2,995 (58%)	1.8%	38	35	36
Asia (excluding China)	1,908 (37%)	2.1%	33	38	33
Africa	623 (12%)	2.9%	24	45	30
Latin America	429 (8%)	2.2%	32	38	68
Europe	497 (10%)	0.3%	266	21	75
USSR	286 (6%)	1.0%	68	26	66
North America	272 (5%)	0.7%	98	21	74

Adapted from Haub, C. and Kent, M. (1988).[1]

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Table 2 Population doubling times of selected countries*

Country	Mid-1988 population (millions)	Annual increase	% Under 15	Doubling time (years)
Kenya	23	4.1	51	17
Tanzania	24	3.6	48	19
Solomon Islands	0.3	3.6	48	19
Nicaragua	3.6	3.5	47	20
Uganda	16	3.4	48	20
Nigeria	112	2.9	45	24
Pakistan	108	2.9	43	24
Philippines	63	2.8	39	24
Egypt	53	2.8	40	24
Haiti	6	2.8	40	25
Vietnam	65	2.6	40	27
Bolivia	7	2.6	43	27
Mexico	84	2.4	42	29
India	817	2.0	38	35
China	1,087	1.4	29	49
United States	246	0.7	22	99
United Kingdom	57	0.2	19	408

*Adapted from Haub, C. and Kent, M. (1988).[1]

lion people before the mid-point of the next century; and India, in turn, is expected to exceed one billion by the year 2000 and, eventually, to overtake China.) When the average doubling time of 29 years for the developing nations (excluding China) is compared with the figure of 408 years for the United Kingdom, the reality of trying to provide quality education in the Third World takes on a new perspective. By and large, because fertility rates have not declined markedly, demographers suggest that immediate future growth will approach the so-called 'high-path' projection of approximately one billion people every 10 years – and most of it will occur in poorer countries least able to cope with rapid increases.

Another interesting comparison between Third World and developed countries is evident in average primary school enrolment increases. Between 1970 and 1980, for example, overall enrolments in developed countries actually declined by about 1 per cent, while in developing countries they increased by 4 per cent (ILO, 1981).[2] Among the latter, the most prominent were in sub-Saharan Africa which recorded an average 7.3 per cent annual increase, followed by Latin America at 4 per cent and Asia at 3 per cent. In contrast, Europe's primary school enrolment dropped during the 10-year period (by 1.2 per cent), as did North America's (by 2.3 per cent). The immediate consequences of Third World population bulges in the under-15 age-bracket have been strains on physical facilities, provision of curricular materials and availability of trained teachers – particularly in the rural areas where the majority of people reside. Faced with such requirements which cannot be met through traditional means, many governments have had to either reduce the level of publicly-supported education or try out innovative solutions. Many of the strategies have focused on the problem of certified teacher shortages stemming from the inability of conventional teacher colleges to keep pace with demands.

Dimensions of teacher shortage

Quantitative aspects

While teacher shortages derive primarily from continually high birth rates, they result also from government policies to achieve universal primary education. For example, the precipitous introduction of such a plan for Nigeria in 1976 resulted in three million new students entering the system in one year alone, and called for the immediate placement of 33,000 new teachers – a 25 per cent increase in the teaching corps – with 290,000 being required by 1982. Similar problems were also experienced in Tanzania in 1977 when school fees were abolished and enrolment became mandatory for Standards I to VII; in this case, 30,000 new primary teachers (a doubling of the existing number) were needed over a two-year period. Other parallel cases may be cited from Lesotho, Swaziland and Zimbabwe, but the most dramatic African example occurred in Algeria after independence in 1963. In this case, student enrolments doubled, while most of the expatriate French teachers – who formed the bulk of the teaching force – returned home.

Yet another contributory factor has been attempts to reduce high teacher–pupil ratios. The most recent data (UNESCO, 1988)[3] suggest that, up to 1982, the ratios in the Third World – at around 1 to 40+ – were at least double those in the industrialised countries. However, in recent trends, it seems likely that such higher ratios will persist in the foreseeable future, as teacher shortages will extend at least until the end of this century, and probably well into the next.

Qualitative aspects

The qualitative dimension of teacher shortfalls relates to the engaging of *professionally untrained* and/or *academically unqualified/underqualified* personnel – with both aspects often being mutually extant. On a regional basis, the problem again seems to be most acute in Africa. For example, an early 1980s study (referred to by Thompson, 1984)[4] showed that the proportion of unqualified primary teachers ranged from 70 per cent in Liberia and 60 per cent in the Gambia to over 50 per cent in Nigeria, 36 per cent in Lesotho and 20 per cent in Malawi, Zambia and Uganda. Internationally, however, the situation is only marginally better, if at all. For instance in 1981,[2] the International Labour Organisation (ILO) estimated that, during the mid-70s, 40 per cent or more of all primary teachers in Bangladesh, Guyana, Jamaica, Sri Lanka, and Trinidad and Tobago had received no training. Also, during the same period, more than half the primary and 90 per cent of the middle-school teachers in India were untrained (Brophy and Dudley, 1982)[5], as were at least a quarter of all

teachers entering the primary schools in Pakistan (World Bank, 1987).[6] Finally, 27 per cent of the primary teachers in Nepal were under-qualified (Sedlak, 1987),[7] and Burma experienced both quantitative and qualitative shortfalls (UNICEF, 1986).[8] (During 1984, the latter required 127,000 primary teachers, but only 90,000 were available – and of these, 27 per cent had not been trained.) On a global basis, it can be realistically estimated that between 20 and 30 per cent of primary teachers in Third World countries are either professionally untrained or academically unqualified.

Strategies to remedy teacher shortages

Double shifts with increasing teacher–pupil ratios

In a number of countries, an immediate solution to teacher shortages has been to introduce a double-shift system for student attendance (eg 7.00 am–12.00 noon for one group of students and 1.00 to 6.00 pm for another), with an increased teacher–pupil ratio in each case. However, this response has served mainly to undermine qualitatively systems which were already weak, producing increased staff workloads and decreased individual student attention.

Expatriate teachers

Many countries continue to invite expatriate teachers to fill gaps in their national teacher supply – largely at secondary school level – with the Peace Corps, the World University Service of Canada and Voluntary Service Overseas (VSO) being prominent examples in the English-speaking developing world. Apart from cultural integration problems, high turn-over rates cause inconsistencies in local teaching patterns. Foreign teachers are also normally paid at higher rates and enjoy more extensive benefits than nationals with the same qualifications; and so replacement of expatriates by nationals frees budgetary resources to train and hire more teachers, upgrade salary levels and improve working conditions.

Increasing female participation

A unique problem in many developing countries, and notably those which are predominantly Moslem, has been the low participation of females in the teaching ranks. For example, the ILO report mentioned earlier[2] indicated that during 1976 and 1979, women accounted for less than 25 per cent of the teaching force in 20 African and Asian countries. This lack of women teachers has, in general, inhibited access to education for female students, since parents, especially in the rural areas, are reluctant to send their daughters to schools with only male teachers. To illustrate, the World Bank (1987)[6] estimated that in 1985 only about one in three girls in rural Pakistan entered primary school; that less than one in six will complete five years (considered to be the minimum level to achieve basic literacy); and that only 1 per cent will go on to high school. The end-product of such a situation has been an overall dearth of women available to enter the teaching profession and a perpetuation of one of the most serious impediments to the development of primary education.

Home- or community-based school equivalency programmes

Several countries have recognised that the likelihood of providing schools and fully-qualified teachers in the face of increasing population pressures is remote and have looked for other solutions. Among the more prominent examples is that of ACPO (Acción Cultural Popular) in Colombia which uses radio broadcasts, supplemented by text materials and village co-ordinators, to bring basic and primary education to the two-thirds majority of young people and adults in the country not served by the formal education system.

Other notable successes include Telesecundaria in Mexico which transmits instructional television programmes, at the junior secondary level, to learning groups gathered in places such as churches and village meeting-halls; the tele-courses are supported by textbooks and co-ordinators who, in this case are certified primary teachers. Also, a similar system operating in the Dominican Republic – RADECO – uses radio to deliver the first four years of primary education to youngsters who spend most of their day working on coffee plantations or in sugar cane fields; the children gather for 90 minutes in the late afternoon to listen to the broadcasts, which are introduced and followed up by community volunteers, and to do print-based assignments which accompany each radio lesson. Finally, on the other side of the world, the Korean Air and Correspondence High Schools use radio broadcasts, specially prepared textbooks and other printed self-study material – plus tutorial meetings every second weekend – to provide the last three years of high school to about half of the eligible high school students who are unable to enter regular classes.

All of the above systems are highly cost-effective and provide alternatives for a multitude of learners who would otherwise be denied access to formal educational opportunities.

In-school equivalency programmes

A more direct approach to meeting the shortage of personnel for existing schools has been the placement of untrained teachers or monitors into classrooms to lead, and follow up, direct instruction via television – with upgraded or re-written textbooks accompanying the broadcasts. Such was the case for the first eight grades in American Samoa from 1964 to 1980, with expansion to high school level in 1966. The Ivory Coast underwent a similar process from 1970 to 1980 with 80 per cent of all primary school children in the country (grades one to six) being taught via television. In both these examples, in-service teacher training operated in parallel with televised school instruction.

Other notable projects include the on-going TV Maranhão in Brazil directed at children in middle primary grades, and the Mauritius College of the Air – which ran from 1973 to 1980 – for secondary students.

Schools broadcasts

Yet another variation to improve the quality of school instruction has been the use of broadcasts, mostly through radio, to enhance teacher lectures. In contrast to the in-school equivalency programmes described above, in this case the teacher has the option of using or not using the broadcasts depending upon his/her perception of their value for a given class. Usually, the broadcasts are accompanied by teachers' notes and student exercise manuals.

Outstanding examples of this form of teaching enhancement include the Schools Broadcasting Service in Kenya (Coldevin, 1980),[9] Radio Mathematics in Nicaragua, Thailand, and Bolivia (Galda, 1984;[10] Tilson, 1987[11]), English Language Radio in Lesotho and Teaching Science by Radio in Papua New Guinea (Tilson, 1987).[11] The mathematics, science and English programmes all use a technique known as 'interactive radio' which requires students to actively respond,

every 10 to 20 seconds, during each lesson. When compared with students in regular classrooms, such radio students have demonstrated up to 70 per cent superior achievement in mathematics tests and almost 50 per cent in English comprehension and reading skills.

In-service teacher education through distance teaching

In the wake of severe teacher shortages, most countries have attempted, as a matter of course, to increase the output of their conventional training colleges. In some cases, lowering of entrance standards has been combined with shortening the study time for teacher certification. A further strategy, which has steadily gained ground during the past 15 years, has involved recruiting professionally untrained or academically unqualified teachers, pressing them into service, and then bringing them up to certification or qualification level through in-service distance education programmes.

The advantages of distance education (DE) for in-service teacher training are manifold:

- From the practising teachers' viewpoint, studying *in situ* means that they can attain professional certification or academic upgrading without interrupting their earnings, a significant point in developing countries where many teachers also have small farms.
- Large numbers can be served at any one time with no discrimination against those who live in remote areas; and the economic studies conducted (though admittedly limited in number) show that DE training costs per student are typically two-thirds to one-half those of campus-based instruction (Brophy and Dudley, 1982;[5] Coldevin, 1980;[9] Lalor and Marrett, 1986[12]).
- It obviates the problem of replacing the teachers on college-based courses with substitutes who – when they can be found at all – often have even poorer qualifications; and it reduces the tendency towards urban drift resulting from trainees from rural areas not wanting to return to their original posts.
- The teacher's work situation can serve as a basic resource for his/her studies – with learning applied immediately in the classroom; sharing learning experiences with village-based colleagues can provide a multiplier effect; and DE print materials are frequently valuable references in locations where access to libraries is limited.

Also, more generally, in developing countries certification appears to have a significant positive relationship with the quality of teachers' work – particularly in those countries with lower per capita incomes (Guthrie, 1985);[13] and while most of the studies included in Guthrie's analysis were based on conventional teacher training, the evidence which does exist suggests that DE-trained teachers are as good as their college-trained counterparts (Brophy and Dudley, 1983;[14] Lalor and Marrett, 1986[12]).

In 1982, Brophy and Dudley[5] identified 53 Third World projects using DE for teacher training (and it is estimated that at least this number are currently operating). Fourteen of them used correspondence materials alone, with five supplementing them with broadcasting and eight with face-to-face tuition; and the remainder used a combination of print, broadcasting, and occasional face-to-face teaching. Only those that employed the three-way approach are examined here.

Distance education projects in teacher education range from large-scale programmes carried out in the Ivory Coast, Tanzania, Sri Lanka and Nigeria to medium-sized and smaller ones in Nepal, Malawi, Botswana, Lesotho and Swaziland. In addition, many of the Third World distance teaching universities have in-service certificate programmes (eg in Costa Rica, Pakistan, Venezuela, Thailand, and Colombia). From among the many cases which might have been selected for in-depth analysis, this paper concentrates on three representative examples of current practise viz:

- Kenya's attempts to meet varying national teacher-training needs over the last 20 years;
- the activities of the only remaining regional universities in the world, those of the South Pacific and the West Indies.

In the first case, radio broadcasts and print materials have been used; the two universities employ satellite-relayed tele-courses, texts, and a variety of other media support; and all three rely on counselling, occasional face-to-face instruction and supervision of teaching practice.

Current models of distance education practice

Kenya

In-service teacher training began in Kenya in 1967 under the aegis of the Correspondence Course Unit (CCU) of the Institute of Adult Studies, University of Nairobi. From its inception, its immediate priority – and one which is currently being revitalised – was to upgrade the skills of primary school teachers, over 25 per cent of whom (10,000 out of 38,000 in 1968) were classified as unqualified. (A qualified teacher at the lowest or P3 level would normally have seven or eight years of primary school, plus two years of teachers' college training.) The programme for unqualified teachers (UQT) was conducted in two phases. The first concentrated on training in teaching methods and consisted of three short residential courses, supplemented by radio broadcasts and correspondence material in between; those who were successful were then admitted to a second 'academic year' consisting of first-year high school studies, with required passes in three subjects (English, mathematics and either history or geography). Candidates passing the final examinations were then upgraded to P3 status.

Each CCU course was made up of four components:

- correspondence study guides, textbooks and other learning materials, such as maps and mini-laboratory kits;
- radio broadcasts;
- student assignments marked by qualified secondary school and university teachers;
- face-to-face teaching during occasional residential sessions.

In practice, correspondence materials were supplemented by 15-minute radio programmes broadcast twice per week on the VOK National Radio Service. Typically, the radio presenter would highlight important points in each lesson and provide a summary at the end of each teaching unit.

A number of surveys were undertaken during the early 1970s to assess the CCU's performance and, among the findings, notable highlights included the following (Coldevin, 1980):[9]

- The pass-rate for CCU high school students was almost double that of traditional high school students. (In 1970, for example, the national average pass-rate

was 27 per cent, as opposed to 51 per cent for CCU students.)

- Between 1969 and 1972, 10,000 unqualified teachers, representing 82 per cent of those enrolled, successfully completed the programme and were upgraded to P3 status.
- The system's cost during the first five years of operation was about two-thirds of that expended per student in traditional settings.

The UQT programme was halted in 1974 and the CCU continued with course offerings leading to the Kenya Junior Secondary Examination (KJSE), which was required for promotion from P3 to P2 level. As it turned out, however, the halting of the UQT programme was premature. In 1974, the government announced the elimination of school fees for levels one to four – extending each year thereafter to the remaining primary levels (up to the final seventh level). As a consequence of this, and an annual population increase of 3.5 per cent, enrolments increased to the point that, by 1980, 40,000 more unqualified teachers – or a third of the teaching corps – had to be hired and the UQT reactivated to train them.

Also, in 1985, the Fifth Development Plan for Kenya launched the introduction of the 8-4-4 system (eight years of primary schooling, four years of secondary schooling and four years for Bachelor level studies at university). This move, plus an annual population rise of 4 per cent, necessitated the recruitment of 22,500 additional untrained primary teachers, bringing the total number up to 50,000 – again about one-third of the nation's primary teaching force. In the same year, the College of Adult and Distance Education (initially created a couple of years earlier to incorporate and enlarge the Institute of Adult Studies) was reorganised into four divisions – the School of Distance Studies (formerly the CCU), the Institute of Extra-mural Studies, the Institute of Adult Studies and the Faculty of External Degree Studies. Overall, the College functions as the adult extension arm of the University of Nairobi and is one of its six constituent colleges.

The School of Distance Studies (SDS) revitalised in-service training for primary teachers and, at present, offers a common three-year programme for three categories of primary student teachers:

- P1 Normally those with 12 years of formal schooling, but no professional qualification;
- P2 Those with at least 10 years of formal schooling, but no professional training;
- P3 Those with a maximum of two years of secondary education, but with the majority having only seven to eight years of primary schooling.

All student teachers entering their respective programmes are required to have a minimum of three years of teaching experience, and 1987 enrolments totalled about 3,600 spread over the three levels.

To qualify for the respective levels, students are required to pass 10 subjects, six of which are compulsory (professional studies, English, Kiswahili, mathematics, physical education and science) and four electives (from agriculture, home science, geography, history, art, music and Christian/Islamic religious education). In addition, supervised teaching practice is compulsory and assessments are made three times each year.

The programme comprises three components (Gitau, 1986):[15]

- Print correspondence materials (80 per cent);
- Support radio broadcasts;
- Seven weeks of face-to-face tuition in one of the 13 primary teachers' colleges – two weeks each during April and August school holidays and three weeks during the December school break.

A survey carried out during 1985, shortly after the programme was inaugurated (Matiru, 1987),[16] revealed that the majority of teachers had been practising for between six and 10 years without formal training, and many had been doing so for 11 to 15 years. The major general problems identified centred on the quality of the print materials (lack of pre-testing for clear presentation) and their timely delivery. Also, while only about 30 per cent of students listened regularly to the radio programmes, those who did so performed consistently better on examinations; and the majority considered the support received from their tutors to have been helpful.

The College of Adult and Distance Education enrols some 9,000 students for regular, campus-based courses, under the rubric of the Faculty of External Degree Studies. However, in 1985, it also launched a BEd (Arts) at a distance, for practising secondary teachers. (Out of 19,368 high school teachers in service in that year, 8,648 or 45 per cent did not hold the required BEd degree (Kinyanjui, 1987)[17].) The full programme lasts six years, divided into three parts of two years each, each part being the equivalent of one academic year for a full-time residential student. During its first cycle, about 600 students out of 3,000 applicants were admitted. Twelve academic and 20 support staff have been recruited for headquarters' operations; 54 part-time course writers have been appointed, and about 200 tutors have been drawn from colleges and high schools thoughout the country. The courses are conducted mainly through correspondence materials and tutoring/counselling services, although regional libraries and resource centres offering audio-visual support are being planned.

In sum, Kenya has been a pioneer in the use of DE for teacher training. The impetus for its early initiatives, however, is perhaps more than ever in evidence at present given its annual population increase of 4.1 per cent, an average fertility rate of eight children per woman, and the fact that 51 per cent if its population are under the age of 15. As such, DE is expected to play an increasingly important role in the daunting task of bringing up to one-third of the teaching force to certified standards.

Regional university systems

• *The University of the South Pacific* The University of the South Pacific (USP) was established in 1968 – with its administrative centre at Suva in Fiji, the most populous country in the region – to provide higher education for the countries and territories of the South-west Pacific. Currently 11 independent island states are included in the network (Solomon Islands, Cook Islands, Fiji Islands, Kiribati, Tuvalu, Republic of Nauru, Vanuatu, Niue, Tokelaus, Kingdom of Tonga, and Western Samoa), comprising a total population of about 1.6 million people spread over 11 million square miles of ocean.

The objectives of the University expressed in its Charter are directed towards '. . . the maintenance, advancement and dissemination of knowledge by teaching, consultancy and research and the provision of appropriate levels of education and training responsive to the well-being and needs of the communities of the South-west Pacific' (USP, 1970).[18] Because of the distances and costs involved in student travel, it was decided early on that a single campus would not meet the needs of the region. Extension Centres were, therefore, developed (currently functioning in 10 of the 11

countries) and directly linked to the main campus through satellite audio-teleconferencing, beginning in 1974. Each Centre has a full-time local staff of administrators and tutors. This greatly facilitated the development of DE, which began as part of the School of Education's services but is now co-ordinated by the Extension Services Department.

The first DE offerings, in 1971, were courses leading to a Diploma in Education, as part of a three-year pre-service programme for secondary school teachers. By the early 1980s, however, the demand for pre-service teacher education had begun to weaken – so much so that by 1983 the School of Education curtailed its pre-service activities to concentrate exclusively on in-service teacher education at a distance. This major shift in focus, plus an enhanced DE capability of the University in general, now makes it possible for practising teachers in the region to study for a BEd degree at a distance through four stages:

1 *The Certificate in Foundation Studies* is intended for teachers with at least two years of practical experience. It comprises five subjects, two in each of two teaching subjects, plus one other, and in essence is a pre-qualifying year for university entrance. Successful completion leads to stage 2.
2 *The Certificate in Education* is the equivalent of the first year of the BEd programme and consists of eight courses, two required in Education, two in each of two approved teaching areas, and the remaining two from any other first-year courses. Typically, these requirements are completed in two years and qualify candidates to enter stage 3. Students who stop at this level would normally teach in primary schools (classes 1–6).
3 *The Diploma in Education* is the equivalent of the second year of the BEd programme. It is made up of six courses, of which at least three must be in Education and two in an approved teaching area, with one elective allowed. Practising teachers studying part-time are expected to complete this stage in two years. If they do not go on to the final stage, they would qualify for teaching at the Junior Secondary level (Forms 1–4).
4 *The Bachelor in Education* stage comprises the final year of the BEd programme and is made up of two majors, one in Education and the other in an approved teaching area, both involving three courses. As with the Certificate and Diploma, another two years is anticipated as the time-frame to complete this stage. Teachers with a BEd degree would generally teach at the upper secondary level (Forms 5, 6 and 7).

As noted earlier, each of the four stages comprises a short-term goal in itself. Candidates may leave the programme at the end of any of the stages with that qualification and return to the next level at their convenience. It is now also possible to pursue a Master's degree (MPhil) through DE combined with summer sessions in areas such as educational administration and evaluation. Altogether, it is estimated that over 50 per cent of the 1987 student enrolment of 7,059 in the distance teaching mode were involved in teacher education courses (USP, 1987).[19]

As in most DE university operations, print materials provide the mainstay of course content. These are designed, developed and produced by regular University faculty members, with the assistance of in-house instructional designers and media staff, and their distribution is handled mainly through the various Extension Centres. While some aspects of assignments may be graded locally, the major portion of students' work is assessed by regular teaching faculty staff, who are ultimately responsible for maintaining parity between on-campus and DE programmes; and these same staff make on-site visits during summer vacation periods for face-to-face sessions.

A particularly interesting feature of USP is the use of satellite audio teleconferencing for a variety of functions ranging from formal tutorials to regular administrative staff meetings. Normally, University professors in Suva conduct the tutorials for students who meet in the Centres for classes. The interactive nature of the facility, however, allows teachers, students and tutors to ask and answer questions, not only between the main campus and a given Centre, but also between the Centres themselves. Anyone in the system can talk to anyone else by using simple 'push-to-talk' microphones.

Other advantages provided by the satellite include rapid feedback to students on their assignments and advice to local tutors from campus-based professors, both of which would be slow through the mail service. It has also proved useful for administrative tasks such as verifying the distribution of course materials and transferring enrolment data. What started as an experiment in giving formal instruction via satellite over large distances has become an integral component in extending in-service teacher education throughout the South Pacific.

• *The University of the West Indies* The University of the West Indies (UWI) shares much of a common heritage, and similar problems, with its sister institution, USP. Both serve largely Commonwealth, English-speaking, island populations distributed over relatively large distances. Both also quickly recognised the value of a DE approach, supported by satellite teleconferencing, in extending university education, and in-service teacher training, to meet their regional educational aspirations.

In the case of UWI, its mandate is to provide all major fields of educational specialisation for the 14 English-speaking Caribbean islands. Three main campuses have been developed – in Jamaica, Trinidad and Barbados – with University Centres maintained in each of the 11 other countries, as part of the Department of Extra-mural Studies. Because of the costs for outer-island students to attend courses at the main campuses, and for professors to conduct face-to-face lectures in the far-flung Centres, DE alternatives were considered during the late 1970s. As a start, a two-month pilot project using the ATS-3 and ATS-6 satellites was initiated during 1978, with the University setting up video- and audio-teleconferencing interconnections between Jamaica, Barbados and St Lucia. This in turn led to a two-year feasibility study, and the subsequent recommendations were to set up a satellite-based audio-conferencing system which would connect the three main campuses with St Lucia, Dominica and Antigua.

The University of the West Indies Distance Teaching Experiment, or UWIDITE as it became popularly known, began its operations during the autumn of 1983 with two primary DE applications – first-year Bachelor degree courses, and in-service teacher training leading to a Certificate of Education. Basically, there are two streams to the teaching profession in the Caribbean, one through the usual university Bachelor programmes intended for secondary teaching, and the other through teacher training college courses for primary schools. Both streams have felt the need for further training and the University has responded with a one-year campus-based Diploma in Education for university graduates, and a Certificate in Education for primary teachers. In the UWIDITE certificate programme, taken at a distance over a fixed duration of 18 months, students follow

a common core of five subjects (educational psychology, education and social development, argument in education, curriculum development and classroom testing and evaluation) plus (from 1983 to 1985) one of the following specialisations – teaching of the hearing-impaired, reading, mathematics, or sciences. To be eligible for admission, graduates from teacher training colleges must have been practising for a minimum of three years; for those not having attended one, 10 years of teaching experience is required.

The same staff member who is responsible for course tele-lectures prepares the text materials, and is required also to develop scripts where supporting video programmes are produced. Lectures are given at mutually convenient times for students. Like the USP Extension Centres, each UWI Centre has a teleconferencing room large enough to hold about 30 people, and students who gather to hear the lectures can ask questions of their professor or other students, since all locations are connected all the time. At least six microphones and two loudspeakers are provided in each Centre, with recent additions having included slow-scan television, half-inch video playback equipment and tele-writers. Also, each site is equipped with 'scramblers' which allow for the discussion of examinations and other confidential matters among administrators. Students are supported in their coursework by Centre tutors who also assess their progress and provide feedback after teaching practice sessions. However, the final assessment of teaching practicums is carried out by University examiners, usually lecturers in the specialist areas, who travel out from Jamaica to the various island Centres.

Although the system has been in operation for only a relatively short time, the interim report card is impressive. For example, UWIDITE produced the same number of certificate graduates in Dominica in two years as the Certificate Programme had done in the 30-year period up to 1984. Overall, in the six participating islands, the number of certificates awarded on an annual basis doubled when compared with the pre-1984 output, and the cost per DE student was roughly half that expended for a campus-based student. Equally important, DE student examination results were reported as being on a par with their counterparts in full-time college-based courses and the faculty members were satisfied that standards have been maintained (Lalor and Marrett, 1986).[12] Based upon these encouraging results, current planning calls for extension of the UWIDITE network to all 14 countries of the Commonwealth Caribbean.

Postscript

The urgent need to find new, more efficient and cheaper ways to educate the backlog – and continuing entry – of untrained and unqualified serving teachers in the Third World has provided a new 'target of opportunity' for distance education. In the final analysis, as a growing list of countries is realising, if such programmes are carefully designed and implemented – and then monitored and evaluated for continuing improvement – DE can provide effective parallel systems to traditional training patterns. As such, they are likely to remain a continuing, rather than temporary, solution well into the 21st century.

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